REMARKS/ARGUMENTS

Claims 1-14 and 16-20 and new Claim 21 are active in the case. Reconsideration is respectfully requested.

The present invention relates to a laminating adhesive comprising a mixture of a polymer obtained from free-radical polymerizable compounds and a compound containing unsaturated groups and having a molecular weight less than 5000 g/mol.

Specification Amendments

The specification has been amended in order to introduce therein appropriate section headings. Entry of the amendments is respectfully requested.

Claim Amendments

Claim 1 has been amended by limiting component (A) to a polymer that has a Tg ranging from -55 to 0° C. Support for this limitation can be found at page 6, lines 25-26 of the specification. Further, Claim 1 is now defined in terms of a laminating adhesive which is employed to bond at least one substrate and a transparent film to form a high gloss laminate where the transparent film can be embossed without delamination of the laminate. Support for this limitation can be found in original Claim 1 and the examples of the specification, in particular, page 16 and Table 3.

New Claim 21 is supported by the disclosure at page 8, lines 13 to 18 of the text. Accordingly, the amendments that have been made to Claim 1 and new Claim 21 do not introduce new matter into the case. Entry of the amendments into the record is respectfully requested.

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As to the matter of the citation of the four documents at page 5, lines 22-23 of the specification, applicants point out that EP-A-377199 has a U. S. counterpart of 5,128,386; DE-A-4 037 079 has a U. S. counterpart of 5,223,645; EP-A-346734 has a U. S. counterpart of 5,264,533 and DE-A-3 844 444 has a U. S. counterpart of 5,248,805. A Form 1449 listing the references is enclosed.

Invention

The present invention is directed to method of making a laminate by applying, to at least one substrate, a laminating adhesive comprising (A) a polymer comprised of free-radically polymerized compounds which has a Tg ranging from -55 to 0° C, and (B) compounds comprised of ethylenically unsaturated, free-radically polymerizable groups, wherein the compounds have a weight-average molecular weight of less than 5000 g/mol. The adhesive is placed as a bonding layer between at least one substrate and a transparent film via the laminating adhesive to form a laminate of the at least one substrate and the transparent film, thereby forming a high gloss laminate where the transparent film can be embossed without delamination of the laminate.

Claim Rejection, 35 USC 103

Claims 1-9, 11-14 and 16-20 stand rejected based on 35 USC 103(a) as obvious over Schrof et al, U. S. Patent Publication 2003/0175506 (WO 01/84544) in view of Ha et al 2002/0032251. This ground of rejection is respectfully traversed.

The Schrof et al publication discloses a radiation curable composition different from that of the present invention which further is used in a different manner or purpose than that of the present invention. The composition of the reference is comprised of (a) at least one

radiation crosslinkable polymer that is formed from such monomers described in paragraphs [0030] to [0044] of the reference and (b) a photoinitiator. A preferred initiating system is one in which the phenyl ring of acetophenone or benzophenone is linked to an ethylenically unsaturated group via a spacer segment. Preferably, the system is bonded to the polymer. Dual cure systems are also a possibility. A significant feature of the reference is that the radiation crosslinkable polymer has a glass transition temperature that ranges from -60° to <200° C. On the other hand, the present claims require that the polymer component (A) have a Tg ranging from -55° to 0° C. Although an overlap exists between the two ranges to the extent that the presently claimed range falls within the scope of the range of the publication, nevertheless, the range of the present claims is materially narrower than that of the publication meaning that, in fact, the present polymer component (A) is significantly different from the crosslinkable polymer of the publication.

A second important distinction is the present adhesive requires a second component (B), which is a monomer/oligomer that has ethylenically unsaturated, free radically polymerizable groups and a weight average molecular weight of 250 to 5000 g/mol. On the other hand, the '506 publication does not describe an adhesive that contains such a second monomer or oligomer as an essential component of the composition. This material difference between the present adhesive and that of the publication is such that, whereas the present adhesive is a non-tacky, flexible material as a layer between substrate and film to be bonded which results in a high gloss laminate as shown in the examples that is especially characterized by the lack of separation of film layer from the adhesive in an embossed or fluted object that is prepared, the applied polymer composition when applied to a substrate forms a data recording medium. That is, as described in paragraph [0004] of the publication, the applied cross-linkable polymer composition is subjected to position-resolved irradiation with the result that information is imprinted on the polymer layer which can be read out again

using an appropriate reading device. Thus, the products that are formed in the invention and the reference are quite different which points to the material differences in properties of the adhesive materials.

The Ha et al publication discloses an adhesive composition that is used to specifically bind a coated metallized or siliconized polycarbonate substrate to UV-cured lacquer surfaces. The polycarbonate is rigid and the product that is formed is not flexible, nor does it have a high gloss which the laminated product of the present claims has.

The (A) and (B) components of the presently claimed method of making a laminate also differ substantially from the five component adhesive composition of the publication. As to component (A) of the publication, the same is a radiation curable acrylate oligomer, whereas component (A) of the present claims is a polymer that is formed by free-radical polymerization of appropriate compounds and has a glass transition temperature ranging from -55 to 0° C. As to components (B) and (C) of the composition of the publication, (B) is a non-acrylate reactive diluent (monomer) and component (C) is an acrylate reactive diluent (monomer). On the other hand, component (B) of the present adhesive composition is selected from compounds having unsaturated, free-radically polymerizable groups and are such that they have a weight average-molecular weight of at least 250 g/mol to 5000 g/mol. Accordingly, it is clear that the two components (B) and (C) of the reference do not suggest the component (B) of the present claims. Still a further distinction between the invention and the composition of the publication is that the composition of the publication must contain at least one radical forming sulphur compound (D) (a thiol) whose presence is said to improve the adhesive of the reference with superior adhesive qualities. Such a sulphur containing compound, however, is not a component of the present adhesive.

Actually, of the two components (A) and (B) of the present claims, the radiation curable composition of components (A) to (E) of the publication correspond closest to

component (B) of the present claims. When the oligomer component (A) reacts with the reactive diluents and forms a reactive group containing polyol, as disclosed in paragraph [0067] of the publication, the polyol oligomer material has a maximum molecular weight of about 5000 g/mol. However, it is noted that the Examiner at page 5, lines 13-18 of the Office Action states that paragraph [0070] teaches a molecular weight of less than 5000 g/mol. This does not seem to be correct, because paragraph [0070] of the reference only states that the reactive diluents, i.e., components (B) and (C), not the reaction product of components (A)-(C), have a molecular weight of about 550 or a viscosity at room temperature of less than about 500 mPas. Again, paragraph [0067] states that it is the polyol, if such is chosen, that reacts with a polyisocyanate to form the product urethane oligomer and is characterized by having the molecular weights of paragraph [0067]

Applicants are much concerned about the alleged motivation (page 5, lines 13-18 of the Office Action) one of skill in the art would have to reach into the disclosure of Ha et al and select only reactive diluent (B) of the several components listed, and then combine the selected unsaturated group containing compound for reaction with the polymer of Schrof et al. In the first place, it is clear that in order to make such a judgement, the teachings of the present claims must have been used in hindsight to make such a combination, which is clearly improper. Secondly, Ha et al does not teach component (B) of the document as a single component for consideration as a single material abstractly for use in a variety of reactions that are useful to form polymers or oligomers, but it is taught solely in terms of one of several components, including a thiol compound, that are necessary to form a particular type of adhesive, which is used to CD and DVD electronic recording devices which is a realm of technology completely different from and exclusionary of the utility of the adhesive of the present claims to form high gloss film laminations. Thus, the composition of the reference is substantially different from that of the present invention.

It also must be noted that the context of the invention described in the '2251 publication is the preparation of a compact disc or a DVD which requires the use of an adhesive to bond an aluminium layer to a polycarbonate layer, or a gold layer to a polycarbonate layer or a layer of lacquer to a polycarbonate layer (see [0009]). Once the layer of a device have been placed into contact with each other, the device is exposed to UV radiation in order to complete bonding between layers. The products prepared by the procedure and materials of the patent are not flexible and are not high gloss cards or laminates as prepared in the present invention.

Applicants also point out that, in fact, the two references are not properly combinable, because not only is the adhesive of Ha et al quite different from the adhesive of Schrof et al, but the adhesives are used to prepare completely different products. In Schrof et al, as seen above, a polymer composition is applied to a substrate to form a data recording medium. The applied cross-linkable polymer composition is subjected to position-resolved irradiation with the result that information is imprinted on the polymer layer which can be read out again using an appropriate reading device. On the other hand, the adhesive of Ha et al is used to bond layers together of a DVD or similar device and is not inscribed by some means to contain data or information. Accordingly, it is clear that the combined references do not teach or suggest the claimed invention.

The Higbie et al patent is cited in view of the secondary aspects of the invention in Claim 10. Since patentability does not depend upon the subject matter of the claim, and since the reference does not overcome the deficiencies of the two cited primary references, the claim stands separately patentable and withdrawal of the rejection is respectfully requested.

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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